(2) In the case of finder's applications, information concerning facilities for which authorization(s) have automatically terminated without Commission action. See § 22.167.

(3) The call sign(s) of other facilities in the same area that are ultimately controlled by the real party in interest to the application.

(b) Technical information. The following information is required by FCC Form 401, Schedule B.

(1) Location description; city; county; state; geographical coordinates correct to ±1 second, site elevation above mean sea level;

(2) Antenna manufacturer and type, antenna height to tip above ground level, the height of the center of radiation of the antenna above the average terrain, the height of the antenna center of radiation above the average elevation of the terrain along each of the 8 cardinal radials, antenna gain in the maximum lobe, one to four azimuthal directions of maximum antenna gain, if any, including the azimuth of the maximum lobe of the antenna, a polar plot of the horizontal gain pattern of the antenna, the electric field polarization of the wave emitted by the antenna when installed as proposed;

(3) The center frequency of each channel requested, the maximum effective radiated power, the effective radiated power in each of the cardinal radial directions, the emission types to be used, including bandwidth, the station classification (e.g. base, fixed, mobile).

ONE-WAY PAGING OPERATION

§ 22.531 Channels for one-way paging operation.

The following channels are allocated for assignment to base transmitters that provide one-way public paging service. Unless otherwise indicated, all channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

Low VHF channels

35.20	35.46	43.20	43.46
35.22	35.50	43.22	43.50
35.24	35.54	43.24	43.54
35.26	35.56	43.26	43.56
35.30	35.58	43.30	43.58
35.34	35.60	43.34	43.60
35.38	35.62	43.38	43.62
35.42	35.66	43.42	43.66

High VHF channels

152.24	152.84	158.10	158.70

UHF channels

931.0125	931.2625	931.5125	931.7625
931.0375	931.2875	931.5375	931.7875
931.0625	931.3125	931.5625	931.8125
931.0875	931.3375	931.5875	931.8375
931.1125	931.3625	931.6125	931.8625
931.1375	931.3875	931.6375	931.8875
931.1625	931.4125	931.6625	931.9125
931.1875	931.4375	931.6875	931.9375
931.2125	931.4625	931.7125	931.9625
931.2375	931.4875	931.7375	931.9875

(a) The 43 MHz channels may be assigned under developmental authorizations, pursuant to the requirements of § 22.411.

(b) Channels 931.8875, 931.9125, and 931.9375 MHz may be assigned only to transmitters providing nationwide network paging service.

(c) Upon application (FCC Form 401), common carriers may be authorized to provide one-way paging service using the leased subcarrier facilities of broadcast stations licensed under Part 73 of this chapter.

§ 22.533 Selection and assignment of 931-932 MHz channels.

The Commission selects and assigns a channel when granting applications for authorization to operate a new paging station to transmit in the 931-932 MHz frequency range. Applicants having a preference may request the assignment of a specific channel, but the Commission may in some cases be unable to satisfy such requests. Applications for authorization to operate a new paging station in an established nationwide paging network must specify the channel of the affiliated network (i.e. 931.8875, 931.9125 or 931.9375 MHz).

§ 22.535 Effective radiated power limits.

The effective radiated power (ERP) of base transmitters operating on the channels listed in § 22.531 must not exceed the limits in this section.

(a) Maximum ERP. The ERP must not exceed the applicable limits in this paragraph under any circumstances.

Frequency Range (MHz)	Maximum ERP (Watts)
35-36	600
43-44	500
152-159	1400
931-932	3500

(b) Basic power limits. Except as provided in paragraphs (d) and (e) of this section, the ERP of transmitters on the VHF channels must not exceed 500 Watts, and the ERP of transmitters on the 931-932 MHz channels must not exceed 1000 Watts.

(c) Height-power limit. Except as provided in paragraphs (d) and (e) of this section, the ERP must not exceed the amount that would result in an average distance to the service contour of 32.2 kilometers (20 miles). The average distance to the service contour is calculated by taking the arithmetic mean of the distances determined using the procedures specified in § 22.537 for the eight cardinal radial directions.

(d) Encompassed interfering contour areas. Transmitters are exempt from the basic power and height-power limits of this section if the area within their interfering contours is totally encompassed by the interfering contours of operating co-channel base transmitters controlled by the same licensee. For the purpose of this paragraph, operating transmitters are authorized transmitters that are providing service to the public.

(e) Nationwide network stations. Transmitters on the nationwide network paging channels (931.8875, 931.925, or 931.9375 MHz) are exempt from the basic power and height-power limits of this section.

(f) Adjacent channel protection. The ERP of transmitters must not exceed 500 Watts if they:

(1) transmit on a channel in the 152-159 MHz frequency range and are located less than 5 kilometers (3.1 miles) from any station licensed in the Private Radio Services that receives on an adjacent channel; or,

(2) transmit on channel 158.10 or 158.70 MHz and are located less than 5 kilometers (3.1 miles) from any station licensed in the Public Mobile Services that receives on either of the following adjacent channels: 158.07 MHz or 158.67 MHz.

§ 22.537 Technical channel assignment criteria.

The rules in this section establish technical assignment criteria for the channels listed in § 22.531. These criteria permit channel assignments to be made in a manner such that reception by public paging receivers of signals from base transmitters, within the service area of such base transmitters, is protected from interference caused by the operation of independent co-channel base transmitters.

(a) Contour overlap. The Commission may grant an application requesting assignment of a channel to a proposed base transmitter only if:

(1) the interfering contour of the proposed transmitter does not overlap the service contour of any protected co-channel transmitter controlled by a carrier other than the applicant, unless that carrier has agreed in writing to accept any interference that may result from operation of the proposed transmitter; and,

(2) the service contour of the proposed transmitter does not overlap the interfering contour of any protected co-channel transmitter controlled by a carrier other than the applicant, unless the applicant agrees to accept any interference that may result from operation of the protected co-channel transmitter; and,

(3) the area and/or population to which service would be provided by the proposed transmitter is substantial, and service gained would exceed that lost as a result of agreements to accept interference.

(b) Protected transmitter. For the purposes of this section, protected transmitters are authorized transmitters and transmitters proposed in prior-filed pending applications.

(c) VHF service contour. For paging stations transmitting on the VHF channels, the radial distance from the transmitting antenna to the service contour is calculated as follows:

$$d = 1.169 \times h^{0.40} \times p^{0.21}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(1) Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(2) The value used for p in the above formula must not be less than 27 dB less than the maximum ERP in any direction.

(d) VHF interfering contour. For paging stations transmitting on the VHF channels, the radial distance from the transmitting antenna to the interfering contour is calculated as follows:

$$d = 6.509 \times h^{0.28} \times p^{0.17}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(1) Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(2) The value used for p in the above formula must not be less than 27 dB less than the maximum ERP in any direction.

(e) 931 MHz service contour. For paging stations transmitting on the 931 MHz channels, the service contour is a circle, centered on the transmitting antenna, with a radius determined from Table E-1.

(f) 931 MHz interfering contour. For paging stations transmitting on the 931 MHz channels, the interfering contour is a circle, centered on the transmitting antenna, with a radius determined from Table E-2.

(g) In-building radiation systems. Licensees may install and operate in-building radiation systems without applying for authorization or notifying the Commission. In-building radiation systems operated under this paragraph may provide only public mobile service. The locations of in-building radiation systems must be within the service contour(s) of the licensee's authorized transmitter(s) on the same channel. In-building radiation systems are not protected facilities, and therefore do not have service or interfering contours.

§ 22.539 Additional channel policies.

The rules in this section govern the processing of applications for a paging channel when the applicant has applied or been granted an authorization for other paging channels in the same geographic area. The general policy of the Commission is to assign one paging channel in an area to a carrier per application cycle. That is, a carrier must apply for one paging channel, receive the authorization, construct the station, provide service to the public, and notify the Commission of commencement of service to the public before applying for an additional paging channel in that area. The rules in this section apply only to the channels listed in § 22.531, excluding the nationwide network paging channels.

Table E-1 - 931 MHz Paging Service Radii

Service Radius km (miles)	Effective Radiated Power (Watts)					
Antenna HAAT meters (feet)	0-125	126-250	251-500	501-1000	1001-1860	1861-3500
0-177 (0-581)	32.2 (20)	32.2 (20)	32.2 (20)	32.2 (20)	32.2 (20)	32.2 (20)
178-305 (582-1001)	32.2 (20)	32.2 (20)	32.2 (20)	32.2 (20)	37.0 (23)	41.8 (26)
306-427 (1002-1401)	32.2 (20)	32.2 (20)	37.0 (23)	41.8 (26)	56.3 (35)	56.3 (35)
428-610 (1402-2001)	32.2 (20)	37.0 (23)	41.8 (26)	56.3 (35)	56.3 (35)	56.3 (35)
611-861 (2002-2825)	37.0 (23)	41.8 (26)	41.8 (26)	56.3 (35)	83.7 (52)	83.7 (52)
862-1219 (2826-3999)	41.8 (26)	56.3 (35)	56.3 (35)	83.7 (52)	83.7 (52)	83.7 (52)
1220+ (4000+)	56.3 (35)	56.3 (35)	83.7 (52)	83.7 (52)	83.7 (52)	83.7 (52)

Table E-2 - 931 MHz Paging Interfering Radii

Interfering Radius km (miles)	Effective Radiated Power (Watts)					
Antenna HAAT meters (feet)	0-125	126-250	251-500	501-1000	1001-1860	1861-3500
0-177 (0-581)	80.5 (50)	80.5 (50)	80.5 (50)	80.5 (50)	80.5 (50)	80.5 (50)
178-305 (582-1001)	80.5 (50)	80.5 (50)	80.5 (50)	80.5 (50)	88.5 (55)	96.6 (60)
306-427 (1002-1401)	80.5 (50)	80.5 (50)	88.5 (55)	96.6 (60)	130.4 (81)	130.4 (81)
428-610 (1402-2001)	80.5 (50)	88.5 (55)	96.6 (60)	130.4 (81)	130.4 (81)	130.4 (81)
611-861 (2002-2825)	88.5 (55)	96.6 (60)	96.6 (60)	130.4 (81)	191.5 (119)	191.5 (119)
862-1219 (2826-3999)	96.6 (60)	130.4 (81)	130.4 (81)	191.5 (119)	191.5 (119)	191.5 (119)
1220+ (4000+)	130.4 (81)	130.4 (81)	191.5 (119)	191.5 (119)	191.5 (119)	191.5 (119)

(a) VHF transmitters in same area. Any transmitter on any VHF channel listed in § 22.531 is considered to be in the same geographic area as another transmitter on any other VHF channel listed in § 22.531 if:

(1) one transmitter location is within the service area of the other transmitter; or,

(2) the area within the overlap of the service contours of the two transmitters constitutes 50 percent or more of the service area of either of the transmitters.

(b) 931 MHz transmitters in same area. Any transmitter on any 931 MHz channel is considered to be in the same geographic area as another transmitter on any channel listed in § 22.531 if it is located less than 64.4 kilometers (40 miles) from that transmitter. Likewise, any transmitter on any channel listed in § 22.531 is considered to be in the same geographic area as another transmitter on any 931 MHz channel if it is located less than 64.4 kilometers (40 miles) from that transmitter.

(c) Initial channel. The Commission will not assign more than one channel for new paging stations. Paging stations are considered to be new if there are no authorized transmitters on any channel listed in § 22.531 controlled by the applicant in the same geographic area.

(d) Additional channel. Applications for transmitters to be located in the same geographic area as an authorized station controlled by the applicant, but to operate on a different channel, are considered as requesting an additional channel for the authorized station, unless paragraph (e) of this section applies.

(e) Additional transmitters on same channel. Notwithstanding other provisions of this section, applications for transmitters to be located in the same geographic area as an authorized station controlled by the applicant, and to operate on the same paging channel, are not considered to be requests for an additional paging channel.

(f) Amendment of pending application. If the Commission receives and accepts for filing an application for a transmitter to be located in the same geographic area as a transmitter proposed in a pending application previously filed by the applicant, but on a different channel, the subsequent application is considered as a major amendment to change the technical proposal of the prior application, unless paragraph (e) applies. The filing date of any application so amended is the date the Commission received the subsequent application.

(g) Dismissal of premature applications for additional channel. If the Commission receives an application requesting an additional channel for an authorized station prior to receiving notification that the station is providing service to the public on the authorized channel(s), the Commission may dismiss that application without prejudice as defective.

§ 22.551 Nationwide network paging service.

The rules in this section govern the application for and provision of nationwide network paging service on the channels reserved specifically for such service in § 22.531(b).

(a) Nationwide network organizers. If and when a nationwide network paging channel becomes available for assignment, the Commission will issue a Public Notice inviting applications from carriers seeking to organize a nationwide network paging service. The Public Notice will provide complete details regarding application requirements and procedures.

(c) Affiliated local carriers. Parties seeking to become affiliated local carriers in a nationwide network paging service must have specific completed contracts with the network organizer with which they are proposing to affiliate. Applications may contain a letter, in lieu of the contracts, indicating that the applicant has a completed contract with the organizer.

(d) Liability for technical operation. Nationwide network organizers and affiliated local carriers are jointly and severally liable for the technical operation of the local network stations.

§ 22.559 One-way paging application requirements.

In addition to information required by Subparts B and D and § 22.529 of this part, applications for authorization to operate a paging transmitter on the channels listed in § 22.531 must contain the applicable supplementary information described in this section.

(a) Interference exhibit. Except as provided in paragraph (b) of this section, an exhibit demonstrating compliance with § 22.537 with regard to protected transmitters is required for applications to operate a transmitter on the VHF channels. This exhibit must:

(1) identify each protected transmitter located within 109 kilometers (68 miles) of the proposed transmitter in directions in which the distance to the interfering contour is 76.5 kilometers (47.5 miles) or less, and within 178 kilometers (111 miles) of the proposed transmitter in directions in which the distance to the interfering contour exceeds 76.5 kilometers (47.5 miles).

(2) for each protected transmitter identified, show the results of distance calculations indicating that there would be no overlap of service and interfering contours, or alternatively, indicate that the licensee of or applicant for the protected transmitter and/or the applicant, as required, have agreed in writing to accept any interference resulting from operation of the proposed transmitter.

(b) Encompassment exhibit. An exhibit showing that the area within the interfering contour of the proposed transmitter would be totally encompassed by interfering contours of operating co-channel base transmitters controlled by the applicant is required for applications to operate a transmitter with ERP exceeding the basic power and height-power limits of § 22.535. For VHF transmitters, this encompassment exhibit may substitute for the interference exhibit required in paragraph (a) of this section.

ONE-WAY OR TWO-WAY MOBILE OPERATION

§ 22.561 Channels for one-way or two-way mobile operation.

The following channels are allocated for paired assignment to transmitters that provide (or support other transmitters that provide) one-way or two-way public land mobile service. These channels may be assigned for use by mobile or base transmitters as indicated, and to fixed transmitters (including control, repeater or other fixed transmitters). The mobile channels may also be assigned for use by base or fixed transmitters under certain circumstances (see § 22.567(b) and § 22.147(b)). Unless otherwise indicated, all

channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

VHF channels

base	mobile	base	mobile
152.03	158.49	152.57	157.83
152.06	158.52	152.60	157.86
152.09	158.55	152.63	157.89
152.12	158.58	152.66	157.92
152.15	158.61	152.69	157.95
152.18	158.64	152.72	157.98
152.21	158.67	152.75	158.01
152.51	157.77	152.78	158.04
152.54	157.80	152.81	158.07

UHF channels

base	mobile	base	mobile
454.025	459.025	454.350	459.350
454.050	459.050	454.375	459.375
454.075	459.075	454.400	459.400
454.100	459.100	454.425	459.425
454.125	459.125	454.450	459.450
454.150	459.150	454.475	459.475
454.175	459.175	454.500	459.500
454.200	459.200	454.525	459.525
454.225	459.225	454.550	459.550
454.250	459.250	454.575	459.575
454.275	459.275	454.600	459.600
454.300	459.300	454.625	459.625
454.325	459.325	454.650	459.650

§ 22.563 Provision of rural radio service upon request.

Channels in the frequency ranges 152.03-152.81, 157.77-158.67, 454.025-454.650 and 459.025-459.650 MHz, inclusive, are also allocated for assignment in the Rural Radio Service. Stations in the Paging and Radiotelephone Service authorized to provide public mobile service on these channels must also provide rural radio service upon request from a subscriber.

§ 22.565 Transmitting power limits.

The transmitting power of base, mobile and fixed transmitters operating on the channels listed in § 22.561 must not exceed the limits in this section.

(a) Maximum ERP. The effective radiated power (ERP) of base and fixed transmitters must not exceed the applicable limits in this paragraph under any circumstances.

Frequency Range (MHz)	Maximum ERP (Watts)
152-153	1400
157-159	150
454-455	3500
459-460	150

(b) Basic power limit. Except as provided in paragraph (d) of this section, the ERP of base transmitters must not exceed 500 Watts.

(c) Height-power limits. Except as provided in paragraph (d) of this section, the ERP of base transmitters must not exceed the amount that would result in an average distance to the service contour of 41.8 kilometers (26 miles) for VHF channels or 30.6 kilometers (19 miles) for UHF channels. The average distance to the service contour is calculated by taking the arithmetic mean of the distances determined using the procedures specified in § 22.567 for the eight cardinal radial directions.

(d) Encompassed interfering contour areas. Base transmitters are exempt from the basic power and height-power limits of this section if the area within their interfering contours is totally encompassed by the interfering contours of operating co-channel base transmitters controlled by the same licensee. For the purpose of this paragraph, operating transmitters are authorized transmitters that are providing service to the public.

(e) Adjacent channel protection. The ERP of base and fixed transmitters must not exceed 500 Watts if they transmit on channel 454.025 MHz and are located less than 7 kilometers (4.3 miles) from a Petroleum Radio Service station receiving on adjacent channel 454.0000 MHz.

(f) Mobile transmitters. The transmitter output power of mobile transmitters must not exceed 60 watts.

(g) Other transmitters. The ERP of dispatch and auxiliary test transmitters must not exceed 100 watts.

§ 22.567 Technical channel assignment criteria.

The rules in this section establish technical assignment criteria for the channels listed in § 22.561.

(a) Protection for mobile receivers. The criteria in paragraphs (a)(1) through (a)(6) permit channel assignments to be made in a manner such that reception by public mobile receivers of signals from base transmitters, within the service area of such base transmitters, is protected from interference caused by the operation of independent co-channel base and fixed transmitters.

(1) Contour overlap. The Commission may grant an application requesting assignment of a channel to a proposed base or fixed transmitter only if:

(i) the interfering contour of the proposed transmitter does not overlap the service contour of any protected co-channel transmitter controlled by a carrier other than the applicant, unless that carrier has agreed in writing to accept any interference that may result from operation of the proposed transmitter; and,

(ii) the service contour of the proposed transmitter does not overlap the interfering contour of any protected co-channel transmitter controlled by a carrier other than the applicant, unless the application contains a statement that the applicant agrees to accept any interference that may result from operation of the protected co-channel transmitter; and,

(iii) the area and/or population to which service would be provided by the proposed transmitter is substantial, and service gained would exceed that lost as a result of agreements to accept interference.

(2) Protected transmitter. For the purposes of this section, protected transmitters are authorized transmitters and transmitters

proposed in prior-filed pending applications in both the Paging and Radiotelephone Service and the Rural Radiotelephone Service.

(3) VHF service contour. For base stations transmitting on the VHF channels, the radial distance from the transmitting antenna to the service contour is calculated as follows:

$$d = 1.527 \times h^{0.40} \times p^{0.21}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(i) Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(ii) The value used for p in the above formula must not be less than 27 dB less than the maximum ERP in any direction.

(4) VHF interfering contour. For base and fixed stations transmitting on the VHF channels, the radial distance from the transmitting antenna to the interfering contour is calculated as follows:

(i) if the radial antenna HAAT is less than 150 meters:

$$d = 8.577 \times h^{0.24} \times p^{0.19}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(ii) if the radial antenna HAAT is 150 meters or more:

$$d = 12.306 \times h^{0.23} \times p^{0.14}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(iii) The value used for p in the above formulas must not be less than 27 dB less than the maximum ERP in any direction.

(5) UHF service contour. For base stations transmitting on the UHF channels, the radial distance from the transmitting antenna to the service contour is calculated as follows:

$$d = 1.739 \times h^{0.35} \times p^{0.18}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(i) Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(ii) The value used for p in the above formula must not be less than 27 dB less than the maximum ERP in any direction.

(6) UHF interfering contour. For base and fixed stations transmitting on the UHF channels, the radial distance from the transmitting antenna to the interfering contour is calculated as follows:

(i) if the radial antenna HAAT is less than 150 meters:

$$d = 9.471 \times h^{0.23} \times p^{0.15}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

Whenever the actual HAAT is less than 30 meters (98 feet), 30 must be used as the value for h in the above formula.

(ii) if the radial antenna HAAT is 150 meters or more:

$$d = 6.336 \times h^{0.31} \times p^{0.15}$$

where d is the radial distance in kilometers
h is the radial antenna HAAT in meters
p is the radial ERP in Watts

(iii) The value used for p in the above formulas must not be less than 27 dB less than the maximum ERP in any direction.

(b) Protection for fixed receivers. This paragraph applies only to assignment of the channels designated in § 22.561 as mobile channels to base and fixed transmitters. The criteria in this section permit channel assignments to be made in a manner such that reception by public base and fixed receivers of signals from associated mobile and fixed transmitters is protected from interference caused by the operation of independent co-channel base and fixed transmitters.

(1) Mobile channels are assigned to base and fixed transmitters only if the paired base channel, as designated in § 22.561, is assigned to base transmitters in the same geographical area operated by the same licensee.

(2) [reserved]

§ 22.569 Additional channel policies.

The rules in this section govern the processing of applications for a mobile channel when the applicant has applied or been granted an authorization for other mobile channels in the same geographic area. The general policy of the Commission is to assign no more than two channels in an area to a carrier per application cycle. That is, a carrier must apply for no more than two channels, receive the authorization, construct the station, provide service to the public, and notify the Commission of commencement of service to the public before applying for additional mobile channels in that area. The rules in this section apply only to the channels listed in § 22.561.

(a) Transmitters in same area. Any transmitter on any channel listed in § 22.561 is considered to be in the same geographic area as another transmitter on any other channel listed in § 22.561 if:

(1) one transmitter location is within the service area of the other transmitter; or,

(2) the area within the overlap of the service contours of the two

transmitters constitutes 50 percent or more of the service area of either of the transmitters.

(b) Initial channel. The Commission will not assign more than two channels for new stations. Stations are considered to be new if there are no authorized transmitters on any channel listed in § 22.561 controlled by the applicant in the same geographic area.

(c) Additional channel. Applications for transmitters to be located in the same geographic area as an authorized station controlled by the applicant, but to operate on a different channel, are considered as requests for an additional channel for the authorized station, unless paragraph (d) of this section applies.

(d) Additional transmitters on same channel. Notwithstanding other provisions of this section, applications for transmitters to be located in the same geographic area as an authorized station controlled by the applicant, and to operate on the same channel, are not considered as requests for an additional channel.

(f) Dismissal of application constituting cumulative request for more than two channels. If the Commission receives an application for a transmitter to be located in the same geographic area as a transmitter proposed in a pending application previously filed by the applicant, but on different channels ~~such that~~, considered together, the applications would constitute a request for more than two channels, the Commission may dismiss the subsequent application without prejudice.

(g) Dismissal of premature applications for additional channel. If the Commission receives an application requesting two additional channels (or one additional channel) for an authorized station prior to receiving notification that the station is providing service to the public on all (or all except one) of the authorized channels, the Commission may dismiss that application without prejudice.

§ 22.571 Responsibility for mobile stations.

Mobile stations that are subscribers in good standing to a two-way service in the Paging and Radiotelephone Service are, when receiving service from that station pursuant to legally effective tariff provisions, considered to be operating under the authorization of that station. Licensees are responsible for exercising effective operational control over mobile stations receiving service through their stations.

(a) Installation, maintenance and repair. Except for subscriber-provided mobile transmitters, licensees are responsible for the proper installation, maintenance and repair of mobile transmitters. Subscribers are responsible for the proper installation, maintenance and repair of subscriber-provided mobile transmitters.

(b) Roamers. Mobile stations that are subscribers in good standing to a two-way service in the Paging and Radiotelephone Service are, while receiving service from a different station pursuant to legally effective tariff provisions, considered to be operating under the authorization of such different station. The licensee of such different station is responsible, during such temporary period, for such mobile stations as if they were subscribers to it.

§ 22.573 Use of base transmitters as repeaters.

As an additional function, base transmitters may be used as repeaters. Licensees must be able to turn the base transmitter on or off from the control point regardless of whether a subscriber-operated transmitter is transmitting.

§ 22.575 Use of mobile channel for control transmitter.

Carriers may be authorized to control base transmitters using a control transmitter on the paired mobile channel, subject to the conditions in this section. Control transmitters authorized pursuant to the provisions of this section do not have to meet the requirements of § 22.567(b).

(a) This method of control must not be used in any situation in which transmissions from subscriber-operated transmitters would be able to override the functions of the control transmitter.

(b) The control transmitter must be equipped to use coded signals to shut down and reactivate the base transmitter. Additional coded signals may be used for essential functions at the base transmitter, e.g., controlling aeronautical obstruction marking lights on the antenna tower.

(c) Radio equipment in the premises or vehicles of subscribers must be incapable of reactivating the base transmitter after it has been shut down by the licensee.

(d) The control transmitter location must be within the composite service contour of the station on the paired base channel.

§ 22.577 Grandfathered dispatch service.

No new dispatch transmitters or dispatch points are authorized. Carriers that were authorized to provide dispatch service prior to January 1, 1982, and have provided such service continuously since that date may continue to provide such service.

(a) Installation. A grandfathered station licensee may install a dispatch transmitter for one or more subscribers without applying for specific authorization, provided that the following conditions are met.

(1) The dispatch transmitter must use the mobile channel that is paired with the channel used by the grandfathered base station.

(2) The dispatch transmitter antenna must not exceed the criteria in § 17.7 of this chapter that determine whether the FAA must be notified of the proposed construction.

(3) The output power of the dispatch transmitter must not exceed 10 Watts.

(4) The dispatch transmitter must be incapable of overriding the functioning of any control transmitter that may be using the same channel.

(5) The dispatch transmitter must be under the continuous supervision of the licensee.

(b) Notification. Licensees must notify the Commission whenever a dispatch transmitter is installed pursuant to paragraph (a) of this section. The notification must include the name and address of the subscriber(s) for which the dispatch transmitter was installed, the location of the dispatch transmitter, the height of antenna structure above ground and above mean sea level, the channel(s) used, and the call sign and location of the grandfathered base station.

(c) Termination without hearing. Operation of a dispatch transmitter pursuant to paragraphs (a) and (b) of this section may be terminated by the Commission without a hearing upon notice to the licensee.

(d) Dispatch transmitters requiring authorization. A dispatch transmitter that does not meet the requirements of paragraph (a) of this section may be installed only upon grant of an application for authorization therefor.

(e) Permissible communications. A dispatch transmitter operated by a subscriber may communicate only with mobile transmitters operated by that subscriber through the associated base transmitter.

§ 22.579 Operation of mobiles across U.S.-Canada border.

Mobile stations licensed by Canada may receive two-way service while in the United States from stations licensed under this part, after authorization has been granted by the Commission. Mobile stations that normally operate under the authority of base stations licensed under this part may receive two-way service while in Canada from stations licensed under this part or by Canada, upon authorization by Canada.

§ 22.589 One-way or two-way application requirements.

In addition to information required by Subparts B and D and § 22.529 of this part, applications for authorization to operate a transmitter on the channels listed in § 22.561 must contain the applicable supplementary information described in this section.

(a) Interference exhibit. Except as provided in paragraph (b) of this section, an exhibit demonstrating compliance with § 22.567 with regard to protected transmitters is required. This exhibit must:

(1) for UHF channels, identify each protected transmitter located within 108 kilometers (67 miles) of the proposed transmitter in directions in which the distance to the interfering contour is 76.4 kilometers (47.5 miles) or less, and within 178 kilometers (111 miles) of the proposed transmitter in directions in which the distance to the interfering contour exceeds 76.4 kilometers (47.5 miles).

(2) for VHF channels, identify each protected transmitter located within 135 kilometers (84 miles) of the proposed transmitter in directions in which the distance to the interfering contour is 93.3 kilometers (58 miles) or less, and within 178 kilometers (111 miles) of the proposed transmitter in directions in which the distance to the interfering contour exceeds 93.3 kilometers (58 miles).

(3) for each protected transmitter identified, show the results of distance calculations indicating that there would be no overlap of service and interfering contours, or alternatively, indicate that the licensee of or applicant for the protected transmitter and/or the applicant, as required, have agreed in writing to accept any interference resulting from operation of the proposed transmitter.

(b) Encompassment exhibit. An exhibit showing that the area within the interfering contour of the proposed transmitter would be totally encompassed by interfering contours of operating co-channel base transmitters controlled by the applicant is required for applications to operate a transmitter with ERP exceeding the basic power and height-power limits of § 22.565. This encompassment exhibit may substitute for the interference exhibit required in paragraph (a) of this section.

POINT-TO-POINT OPERATION

§ 22.591 Channels for point-to-point operation.

The following channels are allocated for assignment to fixed transmitters that support other transmitters that provide public mobile service. Unless otherwise indicated, all channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

VHF channels

72.02	72.36	72.80	75.66
72.04	72.38	72.82	75.68
72.06	72.40	72.84	75.70
72.08	72.42	72.86	75.72
72.10	72.46	72.88	75.74
72.12	72.50	72.90	75.76
72.14	72.54	72.92	75.78
72.16	72.58	72.94	75.80
72.18	72.62	72.96	75.82
72.20	72.64	72.98	75.84
72.22	72.66	75.42	75.86
72.24	72.68	75.46	75.88
72.26	72.70	75.50	75.90
72.28	72.72	75.54	75.92
72.30	72.74	75.58	75.94
72.32	72.76	75.62	75.96
72.34	72.78	75.64	75.98

UHF channels - State of Hawaii

488.250 ..... 491.250	489.750 ..... 492.750
488.750 ..... 491.750	490.250 ..... 493.250
489.250 ..... 492.250	490.750 ..... 493.750

Microwave channels

(bandwidth individually assigned)

2110.1	2160.1
2110.2	2160.2
2110.3	2160.3
|	|
|	|
|	|
2129.9	2179.9

(a) The 72-76 MHz channels may be assigned under developmental authority pursuant to the requirements of § 22.413.

(b) Channels in the frequency ranges 2110-2130 and 2160-2180 MHz are also allocated for assignment in the Multipoint Distribution Service and the Point-to-Point Microwave Radio Service (see Part 21 of this chapter).

(c) Channels in the frequency ranges 488.250-490.750 and 491.250-493.750 MHz may be assigned only to inter-island fixed stations located in the State of Hawaii.

§ 22.593 Effective radiated power limits.

The effective radiated power of fixed stations operating on the channels listed in § 22.591 must not exceed 150 Watts.

§ 22.599 Assignment of 72-76 MHz channels.

Because of the potential for interference to the reception of TV Channels 4 and 5 by broadcast television sets and video recorders, assignments of the 72-76 MHz channels are subject to the following conditions:

(a) Assignments of 72-76 MHz channels for use within 129 kilometers (80 miles) of a full service TV station transmitting on TV Channel 4 or 5 are subject to the condition that the licensee must eliminate any interference caused to television reception on TV Channels 4 and 5. If the Commission notifies the licensee of an interference problem and the licensee does not resolve the problem within 90 days of such notification, operation of the interfering 72-76 MHz fixed station must be immediately discontinued.

(b) 72-76 MHz channels may be assigned for use within 16 kilometers (10 miles) of a full service TV station transmitting on TV Channel 4 or 5 under a developmental authorization, pursuant to § 22.413. However, for use within 50 meters (164 feet) of a TV station transmitting on TV Channel 4 or 5, 72-76 MHz channels may be assigned under a regular authorization, rather than a developmental authorization.

§ 22.601 Assignment of microwave channels.

Before filing applications for authority to operate stations on the microwave channels listed in § 22.591 or major amendments to such applications, carriers must coordinate the planned channel usage, using the procedure outlined in § 22.150, with affected parties in this radio service and the Point-to-point Microwave Service and the Multipoint Distribution Service. Affected parties are licensees and other applicants with previously filed pending applications whose stations could affect or be affected by operation of the proposed station in terms of interference or restricted ultimate system capacity.

(a) Coordination required. In designing a system or modification thereto, the applicant must select sites, equipment and channels that will avoid harmful interference to all other users. All parties must cooperate fully and make reasonable efforts to resolve technical problems and conflicts that may inhibit the most effective and efficient use of the radio spectrum; however, the party receiving notification is not obligated to suggest changes or re-design a proposal in cases involving conflicts. Applicants should make every reasonable effort to avoid blocking the growth of systems that are likely to need additional capacity in the foreseeable future. The applicant must identify in the application all parties with which the technical proposal was coordinated. In the event that technical problems are not resolved or if an affected party does not respond to coordination efforts within 30 days after notification, an explanation must be contained in the application. Where technical conflicts are resolved by an agreement between the parties that requires special procedures to reduce the likelihood of harmful interference (such as the use of artificial site shielding), or would result in a reduction of quality or capacity of either system, the details thereof must be contained in the application.

(b) Channel selection. In each of these ranges, the applicant must select the highest available channel that would not cause harmful interference to any other stations. For new stations to be located within 80 kilometers (50 miles) of the metropolitan areas listed in § 21.901(c), channels in the 2160-2162 MHz range will not be assigned unless the applicant shows that no alternative channels are available.

(c) Bandwidth. Applicants must request the minimum emission bandwidth necessary to serve the purpose required, including future plans. The Commission will not authorize bandwidths larger than 800 kHz.

§ 22.603 488-494 MHz fixed service in Hawaii.

Before filing applications for authorization of inter-island control and/or repeater stations, applicants must coordinate the planned channel usage with existing licensees and other applicants with previously filed applications, using the procedure outlined in § 22.150. Applicants and licensees shall cooperate fully and make reasonable efforts to resolve any channel usage conflicts. In situations where technical solutions to such conflicts cannot be devised, the Commission may select a channel or channels to assign or may designate the application(s) for hearing. To be acceptable for filing, applications and major technical amendments must contain a certification that coordination has been completed and an exhibit listing the name(s) of the licensees and applicants with which the planned channel usage has been coordinated.

POINT-TO-MULTIPOINT OPERATION

§ 22.621 Channels for point-to-multipoint operation.

The following channels are allocated for assignment to transmitters utilized within point-to-multipoint systems that support transmitters that provide public mobile service. Unless otherwise indicated, all channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

Public Mobile Pool

(25 kHz bandwidth)

928.8625 ..... 959.8625	928.9375 ..... 959.9375
928.8875 ..... 959.8875	928.9625 ..... 959.9625
928.9125 ..... 959.9125	928.9875 ..... 959.9875

(12.5 kHz bandwidth)

928.85625 ... 959.85625	928.93125 ... 959.93125
928.86875 ... 959.85625	928.94375 ... 959.94375
928.88125 ... 959.88125	928.95625 ... 959.95625
928.89375 ... 959.89375	928.96875 ... 959.96875
928.90625 ... 959.90625	928.98125 ... 959.98125
928.91875 ... 959.91875	928.99375 ... 959.99375

Private Radio General Access Pool

(25 kHz bandwidth)

956.2625	956.3125	956.3625	956.4125
956.2875	956.3375	956.3875	956.4375

928.0125 ..... 952.0125	928.1875 ..... 952.1875
928.0375 ..... 952.0375	928.2125 ..... 952.2125
928.0625 ..... 952.0625	928.2375 ..... 952.2375
928.0875 ..... 952.0875	928.2625 ..... 952.2625
928.1125 ..... 952.1125	928.2875 ..... 952.2875
928.1375 ..... 952.1375	928.3125 ..... 952.3125
928.1625 ..... 952.1625	928.3375 ..... 952.3375

(12.5 kHz bandwidth)

956.25625	956.30625	956.35625	956.40625
956.26875	956.31875	956.36875	956.41875
956.28125	956.33125	956.38125	956.43125
956.29375	956.34375	956.39375	956.44375

928.00625	952.00625	928.18125	952.18125
928.01875	952.01875	928.19375	952.19375
928.03125	952.03125	928.20625	952.20625
928.04375	952.04375	928.21875	952.21875
928.05625	952.05625	928.23125	952.23125
928.06875	952.06875	928.24375	952.24375
928.08125	952.08125	928.25625	952.25625
928.09375	952.09375	928.26875	952.26875
928.10625	952.10625	928.28125	952.28125
928.11875	952.11875	928.29375	952.29375
928.13125	952.13125	928.30625	952.30625
928.14375	952.14375	928.31875	952.31875
928.15625	952.15625	928.33125	952.33125
928.16875	952.16875	928.34375	952.34375

Private Radio Power Pool

(25 kHz bandwidth)

928.3625	952.3625	928.6125	952.6125
928.3875	952.3875	928.6375	952.6375
928.4125	952.4125	928.6625	952.6625
928.4375	952.4375	928.6875	952.6875
928.4625	952.4625	928.7125	952.7125
928.4875	952.4875	928.7375	952.7375
928.5125	952.5125	928.7625	952.7625
928.5375	952.5375	928.7875	952.7875
928.5625	952.5625	928.8125	952.8125
928.5875	952.5875	928.8375	952.8375

(12.5 kHz bandwidth)

928.35625	952.35625	928.60625	952.60625
928.36875	952.36875	928.61875	952.61875
928.38125	952.38125	928.63125	952.63125
928.39375	952.39375	928.64375	952.64375
928.40625	952.40625	928.65625	952.65625
928.41875	952.41875	928.66875	952.66875
928.43125	952.43125	928.68125	952.68125
928.44375	952.44375	928.69375	952.69375
928.45625	952.45625	928.70625	952.70625
928.46875	952.46875	928.71875	952.71875
928.48125	952.48125	928.73125	952.73125
928.49375	952.49375	928.74375	952.74375
928.50625	952.50625	928.75625	952.75625
928.51875	952.51875	928.76875	952.76875
928.53125	952.53125	928.78125	952.78125
928.54375	952.54375	928.79375	952.79375
928.55625	952.55625	928.80625	952.80625
928.56875	952.56875	928.81875	952.81875
928.58125	952.58125	928.83125	952.83125
928.59375	952.59375	928.84375	952.84375

Public, Private, Government Shared Pool

(12.5 kHz bandwidth)

932.00625	941.00625	932.25625	941.25625
932.01875	941.01875	932.26875	941.26875
932.03125	941.03125	932.28125	941.28125
932.04375	941.04375	932.29375	941.29375
932.05625	941.05625	932.30625	941.30625
932.06875	941.06875	932.31875	941.31875
932.08125	941.08125	932.33125	941.33125
932.09375	941.09375	932.34375	941.34375
932.10625	941.10625	932.35625	941.35625
932.11875	941.11875	932.36875	941.36875
932.13125	941.13125	932.38125	941.38125
932.14375	941.14375	932.39375	941.39375
932.15625	941.15625	932.40625	941.40625
932.16875	941.16875	932.41875	941.41875
932.18125	941.18125	932.43125	941.43125
932.19375	941.19375	932.44375	941.44375
932.20625	941.20625	932.45625	941.45625
932.21875	941.21875	932.46875	941.46875
932.23125	941.23125	932.48125	941.48125
932.24375	941.24375	932.49375	941.49375

UHF Channels in Specified Urban Areas

Boston

470.0125	473.0125	482.0125	485.0125
470.0375	473.0375	482.0375	485.0375
470.0625	473.0625	482.0625	485.0625
470.0875	473.0875	482.0875	485.0875
470.1125	473.1125	482.1125	485.1125
470.1375	473.1375	482.1375	485.1375
470.1625	473.1625	482.1625	485.1625
470.1875	473.1875	482.1875	485.1875
470.2125	473.2125	482.2125	485.2125
470.2375	473.2375	482.2375	485.2375
470.2625	473.2625	482.2625	485.2625
470.2875	473.2875	482.2875	485.2875

Chicago, Cleveland

470.0125	473.0125	476.0125	479.0125
470.0375	473.0375	476.0375	479.0375
470.0625	473.0625	476.0625	479.0625
470.0875	473.0875	476.0875	479.0875
470.1125	473.1125	476.1125	479.1125
470.1375	473.1375	476.1375	479.1375
470.1625	473.1625	476.1625	479.1625
470.1875	473.1875	476.1875	479.1875
470.2125	473.2125	476.2125	479.2125
470.2375	473.2375	476.2375	479.2375
470.2625	473.2625	476.2625	479.2625
470.2875	473.2875	476.2875	479.2875

New York - Northeastern New Jersey

470.0125	470.1625	476.0125	476.1625
470.0375	470.1875	476.0375	476.1875
470.0625	470.2125	476.0625	476.2125
470.0875	470.2375	476.0875	476.2375
470.1125	470.2625	476.1125	476.2625
470.1375	470.2875	476.1375	476.2875

Dallas-Fort Worth

482.0125	482.1625	485.0125	485.1625
482.0375	482.1875	485.0375	485.1875
482.0625	482.2125	485.0625	485.2125
482.0875	482.2375	485.0875	485.2375
482.1125	482.2625	485.1125	485.2625
482.1375	482.2875	485.1375	485.2875

Detroit

476.0125	479.0125	482.0125	485.0125
476.0375	479.0375	482.0375	485.0375
476.0625	479.0625	482.0625	485.0625
476.0875	479.0875	482.0875	485.0875
476.1125	479.1125	482.1125	485.1125
476.1375	479.1375	482.1375	485.1375
476.1625	479.1625	482.1625	485.1625
476.1875	479.1875	482.1875	485.1875
476.2125	479.2125	482.2125	485.2125
476.2375	479.2375	482.2375	485.2375
476.2625	479.2625	482.2625	485.2625
476.2875	479.2875	482.2875	485.2875

Houston

488.1625	491.1625	488.2375	491.2375
488.1875	491.1875	488.2625	491.2625
488.2125	491.2125	488.2875	491.2875

Los Angeles

470.0125	473.0125	506.0625	509.0625
470.0375	473.0375	506.0875	509.0875
506.0125	509.0125	506.1125	509.1125
506.0375	509.0375		

Miami

470.0125	470.1625	473.0125	473.1625
470.0375	470.1875	473.0375	473.1875
470.0625	470.2125	473.0625	473.2125
470.0875	470.2375	473.0875	473.2375
470.1125	470.2625	473.1125	473.2625
470.1375	470.2875	473.1375	473.2875

Philadelphia

500.0125	503.0125	506.0125	509.0125
500.0375	503.0375	506.0375	509.0375
500.0625	503.0625	506.0625	509.0625
500.0875	503.0875	506.0875	509.0875
500.1125	503.1125	506.1125	509.1125
500.1375	503.1375	506.1375	509.1375
500.1625	503.1625	506.1625	509.1625
500.1875	503.1875	506.1875	509.1875
500.2125	503.2125	506.2125	509.2125
500.2375	503.2375	506.2375	509.2375
500.2625	503.2625	506.2625	509.2625
500.2875	503.2875	506.2875	509.2875

Pittsburgh

470.0125	470.1625	473.0125	473.1625
470.0375	470.1875	473.0375	473.1875
470.0625	470.2125	473.0625	473.2125
470.0875	470.2375	473.0875	473.2375
470.1125	470.2625	473.1125	473.2625
470.1375	470.2875	473.1375	473.2875

San Francisco

482.0125	485.0125	488.0125	491.0125
482.0375	485.0375	488.0375	491.0375
482.0625	485.0625	488.0625	491.0625
482.0875	485.0875	488.0875	491.0875
482.1125	485.1125	488.1125	491.1125
482.1375	485.1375	488.1375	491.1375
482.1625	485.1625	488.1625	491.1625
482.1875	485.1875	488.1875	491.1875
482.2125	485.2125	488.2125	491.2125
482.2375	485.2375	488.2375	491.2375
482.2625	485.2625	488.2625	491.2625
482.2875	485.2875	488.2875	491.2875

Washington, DC

488.0125	491.0125	494.0125	497.0125
488.0375	491.0375	494.0375	497.0375
488.0625	491.0625	494.0625	497.0625
488.0875	491.0875	494.0875	497.0875
488.1125	491.1125	494.1125	497.1125
488.1375	491.1375	494.1375	497.1375
488.1625	491.1625	494.1625	497.1625
488.1875	491.1875	494.1875	497.1875
488.2125	491.2125	494.2125	497.2125
488.2375	491.2375	494.2375	497.2375
488.2625	491.2625	494.2625	497.2625
488.2875	491.2875	494.2875	497.2875

(a) Channels in the Private Radio General Access Pool and the Private Radio Power Pool may be assigned only if the applicant shows that none of the channels in the Public Mobile Pool are available for the proposed use.

(b) Channels in the Public, Private, Government Shared Pool are allocated for assignment in the Private Operational-Fixed Microwave Service (47 CFR Part 94) and to U.S. government fixed stations.

§ 22.623 System configuration.

This section requires a minimum configuration for point-to-multipoint systems using the channels listed in § 22.621.

(a) 928-960 MHz. These channels may be assigned, individually or paired, only to fixed transmitters in a system that controls at least four public mobile base transmitters that transmit on the same channel. If a 932-933 MHz channel and a 941-942 MHz channel are assigned as a pair, the 941-942 MHz channel must be assigned only to control transmitters; the 932-933 MHz channel may be assigned to control or fixed relay transmitters.

(b) 470-512 MHz. These channels may be assigned only individually (unpaired), to control transmitters that directly control at least four public mobile base transmitters that transmit on the same channel. Fixed relay transmitters will not be authorized.

(c) Selection and assignment. The Commission selects and assigns a channel when granting applications for authorization to operate a new station to transmit in the 470-512, 932-933 and 941-942 MHz frequency ranges. Applicants having a preference may request the assignment of a specific channel or channel pair, but the Commission may in some cases be unable to satisfy such requests.

§ 22.625 Transmitter locations.

This section governs where point-to-multipoint transmitters on the channels listed in § 22.621 may be located.

(a) 928-960 MHz. In this frequency range, the required minimum distance separation between co-channel fixed transmitters is 113 kilometers (70 miles). However, this requirement may be waived if the applicant submits an engineering analysis that shows that no interference would be caused to either system. In such a case, a developmental authorization may be issued (see § 22.415). If no interference is experienced during the term of the developmental authorization, the licensee may apply for a regular authorization.

(b) 470-512 MHz. The purpose of the rule in paragraph (b)(1) of this section is to define the areas in which the 470-512 MHz channels are allocated for public mobile use. The purpose of the rules in paragraphs (b)(2) and (b)(3) of this section is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur.

(1) Control transmitter locations. Control transmitter locations must be within 80 kilometers (50 miles) of the designated locations in this paragraph.

Urban area	N. Latitude	W. Longitude
Boston, MA	42°21'24"	71°03'24"
Chicago, IL	41°52'28"	87°38'22"
Cleveland, OH	41°29'51"	81°41'50"
Dallas, TX	32°47'09"	96°47'37"
Detroit, MI	42°19'48"	83°02'57"
Houston, TX	29°45'26"	95°21'37"
Los Angeles, CA	34°03'15"	118°14'28"
Miami, FL	25°46'37"	80°11'32"
New York, NY	40°45'06"	73°59'39"
Philadelphia, PA	39°56'58"	75°09'21"
Pittsburgh, PA	40°26'19"	80°00'00"
San Francisco-Oakland, CA	37°46'39"	122°24'40"
Washington, DC	38°53'51"	77°00'33"

(2) Protection from intermodulation interference. Control transmitter locations must be at least 1.6 kilometers (1 mile) from the main transmitter locations of all TV stations transmitting on TV channels separated by 2, 3, 4, 5, 7, or 8 TV channels from the TV channel containing the frequencies on which the control station will transmit. This requirement is intended to reduce the likelihood of intermodulation interference.

(3) Co-channel protection from control transmitters with high antennas. This paragraph applies only to control transmitters that utilize an antenna height of more than 152 meters (500 feet) above average terrain. The distance between the location of such a control transmitter and the applicable protected TV station location specified in this paragraph must equal or exceed the sum of the distance from the control transmitter location to the radio horizon in the direction of the specified location and 89 kilometers (55 miles - representing the distance from the main transmitter location of the TV station to its Grade B contour in the direction of the control transmitter). The protected TV station locations in this paragraph are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(i) The protected TV station locations are as follows:

Control Transmitter Frequency Range	Protected TV Station Location		
470-476 MHz	Washington, DC	38°57'17"	77°00'17"
476-482 MHz	Lancaster, PA	40°15'45"	76°27'49"

(ii) The distance to the radio horizon is calculated using the following formula:

$$d = \sqrt{17 \times h}$$

where d is the distance to the radio horizon in kilometers
h is the height of the antenna center of radiation above ground level in meters

§ 22.627 Effective radiated power limits.

The effective radiated power (ERP) of transmitters operating on the channels listed in § 22.621 must not exceed the limits in this section.

(a) Maximum ERP. The ERP must not exceed the applicable limits in this paragraph under any circumstances.

Frequency Range (MHz)	Maximum ERP (Watts)
470-512	1000
928-929	50
932-933	30
941-942	600
952-960	150

(b) 470-512 MHz limits. The purpose of the rules in paragraphs (b)(1) through (b)(3) of this section is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur. The protected TV station locations specified in this section are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(1) Co-channel protection. The ERP of control transmitters must not exceed the limits in the tables in paragraphs (b)(1)(ii) and (b)(1)(iii) of this section. The limits depend upon the height above average terrain of the control transmitter antenna and the distance between the control transmitter and the nearest protected TV station location in paragraph (b)(1)(i) of this section.

(i) The protected TV station locations are as follows:

Control Transmitter Frequency Range	Protected TV Station Location		
470-476 MHz	Jacksonville, IL	39°45'52"	90°30'29"
	Mt. Pleasant, MI	43°34'24"	84°46'21"
	Oxford, OH	39°30'26"	84°44'09"
	Washington, DC	38°57'17"	77°00'17"
476-482 MHz	Champaign, IL	40°04'11"	87°54'45"
	Madison, WI	43°03'01"	89°29'15"
	Parkersburg, WV	39°20'50"	81°33'56"
	Fort Wayne, IN	41°05'35"	85°10'42"
	Lancaster, PA	40°15'45"	76°27'49"
482-488 MHz	South Bend, IN	41°36'26"	86°12'48"
488-494 MHz	Philadelphia, PA	40°02'30"	75°14'24"
494-500 MHz	None		
500-506 MHz	Johnstown, PA	40°19'47"	78°53'45"
506-512 MHz	Washington, DC	38°57'49"	77°06'18"
	Waterbury, CT	41°31'02"	73°01'00"

(ii) Table E-3 and E-4 apply to control transmitters in the New York - Northeastern New Jersey and Cleveland urban areas that transmit on channels in the 476-482 MHz range and to control transmitters in the Detroit urban area that transmit on channels in the 482-488 MHz range.

(iii) Tables E-5 and E-6 apply to all control transmitters except those to which Tables E-3 and E-4 apply.

(2) Adjacent channel protection. The ERP of control transmitters must not exceed the limits in Table E-7. The limits depend upon the height above average terrain of the control transmitter antenna and the distance between the control transmitter and the nearest protected TV station location listed in this paragraph. The protected TV station locations are as follows:

Control Transmitter Frequency Range	Protected TV Station Location			TV Channel
470-476 MHz	Hanover, NH	43°42'30"	72°09'16"	(15)
	Madison, WI	43°03'01"	89°29'15"	(15)
	Champaign, IL	40°04'11"	87°54'45"	(15)
	San Diego, CA	32°41'48"	116°56'10"	(15)
	Lancaster, PA	40°15'45"	76°27'49"	(15)
	Parkersburg, WV	39°20'50"	81°33'56"	(15)
476-482 MHz	South Bend, IN	41°36'20"	86°12'44"	(16)
	Pittsburgh, PA	40°26'46"	79°57'51"	(16)
	Mt. Pleasant, MI	43°34'24"	84°46'21"	(14)
	Scranton, PA	41°10'58"	75°52'21"	(16)
482-488 MHz	Hanover, NH	43°42'30"	72°09'16"	(15)
	Fort Wayne, IN	41°05'35"	85°10'42"	(15)
488-494 MHz	Salisbury, MD	38°24'15"	75°34'45"	(16)
494-500 MHz	Philadelphia, PA	40°02'30"	75°14'24"	(17)
500-506 MHz	Washington, DC	38°57'49"	77°06'18"	(20)
506-512 MHz	Harrisburg, PA	40°20'44"	76°52'09"	(21)

Table E-3 - Maximum ERP (Watts) for Control Transmitters (HAAT 152 meters or less)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)									
	15 (50)	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
209 (130)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
201 (125)	1000	1000	1000	1000	1000	1000	1000	850	750	725
193 (120)	1000	1000	1000	1000	900	750	675	600	550	500
185 (115)	1000	1000	800	725	600	525	475	425	375	350
177 (110)	850	700	600	500	425	375	325	300	275	225
169 (105)	600	475	400	325	275	250	225	200	175	150
161 (100)	400	325	275	225	175	150	140	125	110	100
153 (95)	275	225	175	125	110	95	80	70	60	50
145 (90)	175	125	100	75	50					

See § 22.627(b)(1)(ii). This table is for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

Table E-4 - Maximum ERP (Watts) for Control Transmitters (HAAT more than 152 meters)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)					
	152 (500)	305 (1000)	457 (1500)	610 (2000)	762 (2500)	914 (3000)
209 (130)	1000	447	219	117	71	46
193 (120)	500	209	95	50	30	19
177 (110)	225	91	35	19	11	8
161 (100)	100	30	10	5	3	2
153 (95)	50	13	5	3	2	1

See § 22.627(b)(1)(ii). This table is for antenna heights of more than 152 meters (500 feet) above average terrain. For intermediate values of height and/or distance, use linear interpolation to obtain the maximum permitted ERP.

Table E-5 - Maximum ERP (Watts) for Control Transmitters (HAAT 152 meters or less)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)									
	15 (50)	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
261 (162)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
257 (160)	1000	1000	1000	1000	1000	1000	1000	1000	1000	800
249 (155)	1000	1000	1000	1000	1000	875	775	700	625	575
241 (150)	1000	1000	950	775	725	625	550	500	450	400
233 (145)	850	750	650	575	500	440	400	350	320	300
225 (140)	600	575	465	400	350	300	275	250	230	225
217 (135)	450	400	335	300	255	240	200	185	165	150
209 (130)	350	300	245	200	185	160	145	125	120	100
201 (125)	225	200	170	150	125	110	100	90	80	75
193 (120)	175	150	125	105	90	80	70	60	55	50

See § 22.627(b)(1)(iii). This table applies for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

Table E-6 - Maximum ERP (Watts) for Control Transmitters (HAAT more than 152 meters)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)					
	152 (500)	305 (1000)	457 (1500)	610 (2000)	762 (2500)	914 (3000)
261 (162)	1000	501	282	170	110	71
241 (150)	400	209	110	60	36	23
225 (140)	225	102	50	28	16	10
209 (130)	100	48	21	11	7	5
193 (120)	50	19	9	5	3	2

See § 22.627(b)(1)(iii). This table is for antenna heights of more than 152 meters (500 feet) above average terrain. For intermediate values of height and/or distance, use linear interpolation to obtain the maximum permitted ERP.

Table E-7 - Maximum ERP (Watts) for Control Transmitters

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)								
	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
108 (67)	1000	1000	1000	1000	1000	1000	1000	1000	1000
106 (66)	1000	1000	1000	1000	1000	1000	1000	1000	750
105 (65)	1000	1000	1000	1000	1000	1000	825	650	600
103 (64)	1000	1000	1000	1000	1000	775	625	500	400
101 (63)	1000	1000	1000	1000	440	400	350	320	300
100 (62)	1000	1000	1000	525	375	250	200	150	125
98 (61)	1000	700	450	250	200	125	100	75	50
97 (60)	1000	425	225	125	100	75	50		

See § 22.627(b)(2). This table applies to control transmitters in the Boston, Chicago, Cleveland, Detroit, Los Angeles, New York - Northeastern New Jersey, Philadelphia, Pittsburgh and Washington, DC urban areas. This table is for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

(c) Los Angeles area. This paragraph applies only to control transmitters in the Los Angeles urban area that utilize an antenna height of 457 or more meters (1500 or more feet) above mean sea level. The ERP of such transmitters must not exceed the following limits:

Antenna height AMSL in meters (feet)	ERP (Watts)
457 (1500) to 610 (2000)	155
611 (2001) to 762 (2500)	100
763 (2501) to 914 (3000)	70
915 (3001) to 1067 (3500)	50
1068 (3501) to 1219 (4000)	40
1220 (4001) to 1372 (4500)	30
1373 (4501) and above	25

470-512 MHZ TRUNKED MOBILE OPERATION

§ 22.651 470-512 MHz channels for trunked mobile operation.

The following channels are allocated for assignment to transmitters providing trunked public mobile service within the specified urban areas. All channels have a bandwidth of 20 Khz and are designated by their center frequencies in MegaHertz.

Houston

488.0125 ..... 491.0125	488.0875 ..... 491.0875
488.0375 ..... 491.0375	488.1125 ..... 491.1125
488.0625 ..... 491.0625	488.1375 ..... 491.1375

New York - Northern New Jersey

473.0125 ..... 479.0125	473.1625 ..... 479.1625
473.0375 ..... 479.0375	473.1875 ..... 479.1875
473.0625 ..... 479.0625	473.2125 ..... 479.2125
473.0875 ..... 479.0875	473.2375 ..... 479.2375
473.1125 ..... 479.1125	473.2625 ..... 479.2625
473.1375 ..... 479.1375	473.2875 ..... 479.2875

§ 22.653 Eligibility.

Only licensees already authorized to provide trunked mobile service or their successors in interest are eligible to apply for additional use of these channels for trunked mobile service, and then only in the urban areas already authorized.

§ 22.655 Channel usage.

The Commission is redesignating the public mobile channels in the 470-512 Mhz range from trunked mobile operation to point-to-multipoint operation as the demand for trunked mobile service decreases.

(a) The licensees in each market shall measure channel usage at least once every 3 months. These measurements shall be reported to the Commission within 30 days. Measurements shall be taken during the busiest 12-hour periods on 3 days (within a 7-day period) having normal usage. The information must be reported separately for each of the 3 days selected, must be reported by dates, and must disclose the following:

(1) the number of mobile units in service during each of the days specified;

(2) the number of calls completed each hour;

(3) the total number of minutes during each hour that the channels were utilized for communications by the mobile units;

(4) the average channel usage for the busiest hour for the 3 days measured; and

(5) any additional information that more accurately reflects channel usage.

(b) If the measured probability of blocking decreases below 25%, the Commission will redesignate channels not needed to maintain blocking at 25% or less. The number of channels needed to maintain blocking below 25% will be determined from the channel usage reports and the Erlang C tables.

(c) Although two or more channels are necessary to provide trunked service, the Commission may, pursuant to this section, reduce to one the number of channels assigned. In such cases, the licensee may provide non-trunked two-way public mobile service on the one remaining channel.

§ 22.657 Transmitter locations.

The purpose of the rules in paragraphs (a) and (b) of this section is to define the areas in which the 470-512 MHz channels are allocated for public mobile use. The purpose of the rules in paragraphs (c) through (f) of this section is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur. The protected TV station locations specified in paragraphs (d), (e)(1) and (f) of this section are the locations of record as of September 1974, and these do not change even though the TV stations may have been subsequently relocated.

(a) Base transmitter locations. Base transmitter locations must be within 80 kilometers (50 miles) of the designated locations in this paragraph. Mobile transmitters must not be operated at locations more than 129 kilometers (80 miles) from the designated locations in this paragraph.

Urban area	N. Latitude	W. Longitude
Houston, TX	29°45'26"	95°21'37"
New York, NY - NE NJ	40°45'06"	73°59'39"

(b) Mobile area of operation. Mobile transmitters must not be operated at locations more than 48 kilometers (30 miles) from all associated base stations.

(c) Protection from intermodulation interference. Base transmitter locations must be at least 1.6 kilometers (1 mile) from the current main transmitter locations of all TV stations transmitting on TV channels separated by 2, 3, 4, 5, 7, or 8 TV channels from the TV channel containing the frequencies on which the base station will transmit. This requirement is intended to reduce the likelihood of intermodulation interference.

(d) Adjacent channel protection from mobile transmitters. Base transmitter locations must be at least 145 kilometers (90 miles) from the applicable protected TV station locations specified in this paragraph. This requirement is intended to provide a 0 dB mini-

mum desired to undesired signal strength ratio at the Grade B contour of an adjacent channel TV station.

Mobile Transmitter Frequency Range	Protected TV Station Location			TV Channel
470-476 MHz	Lancaster, PA	40°15'45"	76°27'49"	(15)
476-482 MHz	Scranton, PA	41°10'58"	75°52'21"	(16)

(e) Co-channel protection from mobile transmitters. Base transmitter locations must be at least the distance specified in paragraph (e)(2) of this section from the applicable protected TV station locations specified in paragraph (e)(1) of this section. This requirement is intended to provide a 40 dB minimum desired to undesired signal strength ratio at the Grade B contour of a co-channel TV station.

(1) The protected TV station locations are as follows:

Mobile Transmitter Frequency Range	Protected TV Station Location		
470-476 MHz	Washington, DC	38°57'17"	77°00'17"
476-482 MHz	Lancaster, PA	40°15'45"	76°27'49"

(2) The required minimum distance depends upon the effective radiated power (ERP) of the most powerful mobile transmitter(s) in the system:

Mobile unit ERP	Minimum distance	
60 watts	193 kilometers	(120 miles)
50	185	(115)
25	177	(110)
10	169	(105)
5	161	(100)

(f) Co-channel protection from base transmitters with high antennas. This paragraph applies only to base transmitter locations in the New York - Northeastern New Jersey urban area that utilize an antenna height of more than 152 meters (500 feet) above average terrain. The distance between the location of such a base transmitter and the applicable protected TV station location specified in this paragraph must equal or exceed the sum of the distance from the base transmitter location to the radio horizon in the direction of the specified location and 89 kilometers (55 miles - representing the distance from the main transmitter location of the TV station to its Grade B contour in the direction of the base transmitter). The distance to the radio horizon is calculated as follows:

$$d = \sqrt{17 \times h}$$

where d is the distance to the radio horizon in kilometers
h is the height of the antenna center of radiation above ground level in meters

Base Transmitter Frequency Range	Protected TV Station Location		
470-476 MHz	Washington, DC	38°57'17"	77°00'17"
476-482 MHz	Lancaster, PA	40°15'45"	76°27'49"

(g) The Commission may waive specific distance separation requirements of paragraphs (d) through (f) of this section if the applicant submits an engineering analysis which demonstrates that terrain effects and/or operation with less effective radiated power would satisfy the applicable minimum desired to undesired signal strength ratios at the Grade B contours of the protected TV stations.

Table E-8 - Maximum ERP (Watts) for Base Transmitters (HAAT 152 meters or less)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)									
	15 (50)	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
209 (130)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
201 (125)	1000	1000	1000	1000	1000	1000	1000	850	750	725
193 (120)	1000	1000	1000	1000	900	750	675	600	550	500
185 (115)	1000	1000	800	725	600	525	475	425	375	350
177 (110)	850	700	600	500	425	375	325	300	275	225
169 (105)	600	475	400	325	275	250	225	200	175	150
161 (100)	400	325	275	225	175	150	140	125	110	100
153 (95)	275	225	175	125	110	95	80	70	60	50
145 (90)	175	125	100	75	50					

See § 22.659(b)(2). This table is for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

Table E-9 - Maximum ERP (Watts) for Base Transmitters (HAAT more than 152 meters)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)					
	152 (500)	305 (1000)	457 (1500)	610 (2000)	762 (2500)	914 (3000)
209 (130)	1000	447	219	117	71	46
193 (120)	500	209	95	50	30	19
177 (110)	225	91	35	19	11	8
161 (100)	100	30	10	5	3	2
153 (95)	50	13	5	3	2	1

See § 22.659(b)(2). This table is for antenna heights of more than 152 meters (500 feet) above average terrain. For intermediate values of height and/or distance, use linear interpolation to obtain the maximum permitted ERP.

For this purpose, the Grade B contour of a TV station is deemed to be a circle with a 89 kilometer (55 mile) radius, centered on the protected TV station location, and along which the median TV signal field strength is 64 dBμV/m. In any showing intended to demonstrate compliance with the minimum desired to undesired signal ratio requirements of this section, all predicted field strengths must have been determined using the UHF TV propagation curves contained in Part 73 of this chapter.

§ 22.659 Effective radiated power limits.

The purpose of the rules in this section, which limit effective radiated power (ERP), is to reduce the likelihood that interference to television reception from public mobile operations on these channels will occur. The protected TV station locations specified in this section are the locations of record as of September 1974, and these do not change even though the TV stations may have been

Table E-10 - Maximum ERP (Watts) for Base Transmitters (HAAT 152 meters or less)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)									
	15 (50)	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
261 (162)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
257 (160)	1000	1000	1000	1000	1000	1000	1000	1000	1000	800
249 (155)	1000	1000	1000	1000	1000	875	775	700	625	575
241 (150)	1000	1000	950	775	725	625	550	500	450	400
233 (145)	850	750	650	575	500	440	400	350	320	300
225 (140)	600	575	465	400	350	300	275	250	230	225
217 (135)	450	400	335	300	255	240	200	185	165	150
209 (130)	350	300	245	200	185	160	145	125	120	100
201 (125)	225	200	170	150	125	110	100	90	80	75
193 (120)	175	150	125	105	90	80	70	60	55	50

See § 22.659(b)(3). This table applies for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

Table E-11 - Maximum ERP (Watts) for Base Transmitters (HAAT more than 152 meters)

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)					
	152 (500)	305 (1000)	457 (1500)	610 (2000)	762 (2500)	914 (3000)
261 (162)	1000	501	282	170	110	71
241 (150)	400	209	110	60	36	23
225 (140)	225	102	50	28	16	10
209 (130)	100	48	21	11	7	5
193 (120)	50	19	9	5	3	2

See § 22.659(b)(3). This table is for antenna heights of more than 152 meters (500 feet) above average terrain. For intermediate values of height and/or distance, use linear interpolation to obtain the maximum permitted ERP.

subsequently relocated.

(a) Maximum ERP. The ERP of base transmitters must not exceed 1000 Watts under any circumstances. The ERP of mobile transmitters must not exceed 60 Watts under any circumstances.

(b) Co-channel protection from base transmitters. The ERP of base transmitters in the New York - Northeastern New Jersey urban area must not exceed the limits in the tables in paragraphs (b)(2) and (b)(3) of this section. The limits depend upon the height above average terrain of the base transmitter antenna and the distance between the base transmitter and the nearest protected TV station location in paragraph (b)(1) of this section.

(1) The protected TV station locations are as follows:

Base Transmitter Frequency Range	Protected TV Station Location		
470-476 MHz	Washington, DC	38°57'17"	77°00'17"
476-482 MHz	Lancaster, PA	40°15'45"	76°27'49"

(2) Tables E-8 and E-9 apply to base transmitters in the New York - Northeastern New Jersey urban area that transmit on

Table E-12 - Maximum ERP (Watts) for Base Transmitters

Distance to Protected TV Station in kilometers (miles)	Antenna Height Above Average Terrain in meters (feet)								
	30 (100)	46 (150)	61 (200)	76 (250)	91 (300)	107 (350)	122 (400)	137 (450)	152 (500)
108 (67)	1000	1000	1000	1000	1000	1000	1000	1000	1000
106 (66)	1000	1000	1000	1000	1000	1000	1000	1000	750
105 (65)	1000	1000	1000	1000	1000	1000	825	650	600
103 (64)	1000	1000	1000	1000	1000	775	625	500	400
101 (63)	1000	1000	1000	1000	440	400	350	320	300
100 (62)	1000	1000	1000	525	375	250	200	150	125
98 (61)	1000	700	450	250	200	125	100	75	50
97 (60)	1000	425	225	125	100	75	50		

See § 22.659(c)(2). This table applies to base transmitters in the New York - Northeastern New Jersey urban areas. This table is for antenna heights of 152 meters (500 feet) or less above average terrain. For antenna heights between those in the table, use the next higher antenna height. For distances between those in the table, use the next lower distance.

channels in the 476-482 MHz range.

(3) Tables E-10 and E-11 apply to base transmitters in the New York - Northeastern New Jersey urban area that transmit on channels in the 470-476 MHz range.

(c) Adjacent channel protection from base transmitters. The ERP of base transmitters must not exceed the limits in Table E-12. The limits depend upon the height above average terrain of the base transmitter antenna and the distance between the base transmitter and the nearest protected TV station location specified in paragraph (c)(1) of this section.

(1) The protected TV station locations are as follows:

Base Transmitter Frequency Range	Protected TV Station Location			TV Channel
470-476 MHz	Hanover, NH	43°42'30"	72°09'16"	(15)
	Lancaster, PA	40°15'45"	76°27'49"	(15)
476-482 MHz	Scranton, PA	41°10'58"	75°52'21"	(16)
482-488 MHz	Hanover, NH	43°42'30"	72°09'16"	(15)

(2) Table E-12 applies to base transmitters in the New York - Northeastern New Jersey urban area.

Subpart F - Rural Radiotelephone Service

§ 22.701 Scope.

The rules in this subpart govern the licensing and operation of stations and systems in the Rural Radiotelephone Service. The licensing and operation of these stations and systems is also subject to rules elsewhere in this part that apply generally to the Public Mobile Services. However, in case of conflict, the rules in this subpart govern.

§ 22.702 Eligibility.

Existing and proposed communications common carriers are eligible to apply for authorizations to operate central office, interoffice and rural subscriber stations in the Rural Radiotelephone Service. Subscribers are eligible to apply for authorizations to operate rural subscriber stations in the Rural Radiotelephone Service.

§ 22.703 Separate rural subscriber station authorization not required.

A separate authorization is not required for rural subscriber stations for which the effective radiated power does not exceed 60 Watts and for which FAA notification of construction or alteration of the antenna structure is not required (see criteria in § 17.7 of this chapter). Authority to operate such rural subscriber stations is conferred by the authorization of the central office or base station from which they receive service.

§ 22.705 Rural radiotelephone system configuration.

Stations in the Rural Radiotelephone Service are authorized to communicate as follows:

(a) Rural subscriber stations are authorized to communicate with and through the central office station(s) with which they are associated. However, where the establishment of a central office station in this service is not feasible, rural subscriber stations may be authorized to communicate with and through a base station in the Paging and Radiotelephone Service.

(b) Central office stations may communicate only with rural subscriber stations.

(c) Interoffice stations may communicate only with other interoffice stations.

§ 22.709 Rural radiotelephone application requirements.

In addition to information required by Subparts B and D of this part, applications for authorization to operate a station in the Rural Radio Service must contain the applicable supplementary information described in this section.

(a) Interoffice stations. Applications for authority to operate a new interoffice station or to add transmitters or points of communications to an existing interoffice station must contain an exhibit demonstrating that the requested facilities would be used only for interconnecting central office stations and explaining why the use of alternative existing radio or wire facilities is not feasible.

(b) Technical information required. For each transmitter in the Rural Radiotelephone Service, the following information is required by FCC Form 401 Schedule B:

(1) Location description; city; county; state; geographical coordinates correct to ±1 second, site elevation above mean sea level;

(2) Antenna manufacturer and type, antenna height to tip above ground level, the height of the center of radiation of the antenna above the average terrain, the height of the antenna center of radiation above the average elevation of the terrain along each of the 8 cardinal radials, antenna gain in the maximum lobe, one to four azimuthal directions of maximum antenna gain, if any, including the azimuth of the maximum lobe of the antenna, a polar plot of the horizontal gain pattern of the antenna, the electric field polarization of the wave emitted by the antenna when installed as proposed;

(3) The center frequency of each channel requested, the maximum effective radiated power, the effective radiated power in each of the cardinal radial directions, the emission types to be used, including bandwidth, the station classification (e.g. base, fixed, mobile);

(c) No landline facilities. Each application must contain an exhibit showing that it is impracticable to provide the required communication service by means of landline facilities.

(d) Interference exhibit. Applications for central office, interoffice and relay stations must include an exhibit identifying co-channel facilities and demonstrating that the proposed station, if authorized, would not cause interference to the service of those co-channel facilities. This exhibit must:

(1) for UHF channels, identify each authorized transmitter located within 108 kilometers (67 miles) of the proposed transmitter in directions in which the distance to the interfering contour is 76.4

kilometers (47.5 miles) or less, and within 178 kilometers (111 miles) of the proposed transmitter in directions in which the distance to the interfering contour exceeds 76.4 kilometers (47.5 miles).

(2) for VHF channels, identify each authorized transmitter located within 135 kilometers (84 miles) of the proposed transmitter in directions in which the distance to the interfering contour is 93.3 kilometers (58 miles) or less, and within 178 kilometers (111 miles) of the proposed transmitter in directions in which the distance to the interfering contour exceeds 93.3 kilometers (58 miles).

(3) for each authorized transmitter identified, show the results of distance calculations indicating that there would be no overlap of service and interfering contours, or alternatively, indicate that the licensee of or applicant for the protected transmitter and/or the applicant, as required, have agreed in writing to accept any interference resulting from operation of the proposed transmitter.

§ 22.711 Provision of information to applicants.

Licensees in the Rural Radio Service must, upon request by a bona-fide prospective applicant, provide to such applicant the information required by § 22.709 regarding the portion of the licensee's operations that potentially could affect, or be affected by, the prospective applicant's proposed station, if such information is not already on file with the Commission. This information must be provided to the bona-fide prospective applicant within 30 days of receipt of the information request.

§ 22.713 *Construction period for rural radiotelephone stations.*

The construction period for stations in the Rural Radiotelephone Service is 12 months.

§ 22.715 Technical channel assignment criteria for rural radiotelephone stations.

Channels are assigned in the Rural Radiotelephone Service using the procedures in § 22.567 to develop service and interfering contours.

§ 22.717 Procedure for mutually exclusive applications in the Rural Radiotelephone Service.

Mutually exclusive applications in the Rural Radiotelephone Service and the Paging and Radiotelephone Service are processed in accordance with the rules set forth in § 22.509 of this part.

CONVENTIONAL RURAL RADIO STATIONS

§ 22.725 Channels for conventional rural radiotelephone stations.

The following channels are allocated for paired assignment to transmitters that provide conventional rural radiotelephone service. These channels may be assigned for use by central office or rural subscriber stations as indicated, and interoffice stations. These channels may be assigned also for use by relay stations in systems where it would be impractical to provide rural radiotelephone service without the use of relay stations. All channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

VHF channels

central office	rural subscriber	central office	rural subscriber
152.03	158.49	152.57	157.83
152.06	158.52	152.60	157.86
152.09	158.55	152.63	157.89
152.12	158.58	152.66	157.92
152.15	158.61	152.69	157.95
152.18	158.64	152.72	157.98
152.21	158.67	152.75	158.01
152.51	157.77	152.78	158.04
152.54	157.80	152.81	158.07

UHF channels

454.025	459.025	454.350	459.350
454.050	459.050	454.375	459.375
454.075	459.075	454.400	459.400
454.100	459.100	454.425	459.425
454.125	459.125	454.450	459.450
454.150	459.150	454.475	459.475
454.175	459.175	454.500	459.500
454.200	459.200	454.525	459.525
454.225	459.225	454.550	459.550
454.250	459.250	454.575	459.575
454.275	459.275	454.600	459.600
454.300	459.300	454.625	459.625
454.325	459.325	454.650	459.650

(a) The channels listed in this section are also allocated for assignment in the Paging and Radiotelephone Service.

(b) In Puerto Rico and the Virgin Islands, channels in the 154.04-154.46 MHz and 161.40-161.85 MHz frequency ranges may be assigned to transmitters providing rural radiotelephone service; these ranges are also allocated for assignment in the International Fixed Public and Aeronautical Fixed radio services.

(c) In Alaska, channels 42.40, 44.10, 44.20 and 45.90 MHz are allocated for assignment to transmitters providing rural radiotelephone service using meteor burst propagation modes, subject to the provisions of § 22.719.

§ 22.729 Meteor burst propagation modes.

The rules in this section govern stations in this service that use meteor burst propagation modes to provide rural radiotelephone service in Alaska.

(a) Channel assignments. The channels 42.40 and 44.10 MHz may be assigned to central office stations and rural subscriber stations, respectively, on a primary basis. The channels 44.20 and 45.90 MHz may be assigned to central office and rural subscriber stations, respectively, on a secondary basis to Private Radio services stations using meteor burst propagation modes.

(b) Transmitting power. The transmitter output power must not exceed 2000 Watts for central office stations and 500 Watts for rural subscriber stations.

(c) Station locations. Co-channel central office stations of different licensees must be at least 241 kilometers (150 miles) apart.

A rural subscriber station and a central office station of different licensees must be at least 241 kilometers (150 miles) apart if the rural subscriber stations of the different licensees operate on the same channel. The Commission may waive the requirements of this paragraph if the affected users agree to a cooperative sharing arrangement.

(d) Emission type. Only type F1D emission is authorized.

(e) Bandwidth. The authorized bandwidth is 20 kHz.

(f) Station identification. Station identification is required only for the central office station.

(g) Interference. Stations authorized under the provisions of this section must not cause harmful interference to the service of stations in other radio services.

(h) Developmental authorization. Meteor burst communications systems may be authorized under developmental authorizations pursuant to § 22.419.

§ 22.731 Emission limitations.

Upon application for multichannel operation, the Commission may authorize emission bandwidths wider than those specified in § 22.357, provided that spectrum utilization is equal to or better than that achieved by single channel operation.

§ 22.733 Priority of service.

Within the Rural Radiotelephone Service, the channels listed in § 22.725 are intended primarily for use in rendition of public message service between rural subscriber and central office stations and to provide radio trunking facilities between central offices. However, the channels may also be used for the rendition of private leased-line communication service provided that such usage would not reduce or impair the extent or quality of communication service which would be available, in the absence of private leased-line service, to the general public receiving or subsequently requesting public message service from a central office.

§ 22.737 Temporary fixed stations.

The Commission may, upon proper application therefor, authorize the construction and operation of temporary fixed stations. Temporary fixed stations are to be used as rural subscriber, interoffice, or central office stations when those stations are unavailable or when service from those stations is disrupted by storms or emergencies.

(a) Six month limitation. If it is necessary for a temporary fixed station to remain at the same location for more than six months, the licensee of that station must apply for authorization to operate the station at the specific location at least 30 days before the end of the six month period.

(b) International communications. Communications between the United States and Canada or Mexico must not be carried out using a temporary fixed station without prior authorization from the Commission. Licensees desiring to carry out such communications should apply sufficiently in advance to allow for the time necessary to coordinate with Canada or Mexico.

BASIC EXCHANGE TELEPHONE RADIO SYSTEMS

§ 22.757 Channels for basic exchange telephone radio systems.

The channels listed in § 22.725 are also allocated for paired assignment to transmitters in basic exchange telephone radio systems. In addition, the following channels are allocated for paired assignment to transmitters in basic exchange telephone radio systems. All channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

UHF channels - shared with Private Radio Services

rural subscriber	central office	rural subscriber	central office
816.2375	861.2375	816.1125	861.1125
817.2375	862.2375	817.1125	862.1125
818.2375	863.2375	818.1125	863.1125
819.2375	864.2375	819.1125	864.1125
820.2375	865.2375	820.1125	865.1125
816.2125	861.2125	816.0875	861.0875
817.2125	862.2125	817.0875	862.0875
818.2125	863.2125	818.0875	863.0875
819.2125	864.2125	819.0875	864.0875
820.2125	865.2125	820.0875	865.0875
816.1875	861.1875	816.0625	861.0625
817.1875	862.1875	817.0625	862.0625
818.1875	863.1875	818.0625	863.0625
819.1875	864.1875	819.0625	864.0625
820.1875	865.1875	820.0625	865.0625
816.1625	861.1625	816.0375	861.0375
817.1625	862.1625	817.0375	862.0375
818.1625	863.1625	818.0375	863.0375
819.1625	864.1625	819.0375	864.0375
820.1625	865.1625	820.0375	865.0375
816.1375	861.1375	816.0125	861.0125
817.1375	862.1375	817.0125	862.0125
818.1375	863.1375	818.0125	863.0125
819.1375	864.1375	819.0125	864.0125
820.1375	865.1375	820.0125	865.0125

(a) Channels are assigned in groups, as listed in this section.

(b) Channel groups in the 816-865 Mhz frequency range are not assigned to Rural Radio Service stations located:

(1) within 161 kilometers (100 miles) of the borders of the largest 54 MSAs (see § 22.909).

(2) north of Line A or east of Line C; or,

(3) within 110 kilometers (68 miles) of the Mexican border.

(c) Channel groups in the 816-865 Mhz frequency range are not assigned to central office stations located within 113 kilometers (70 miles) of another station authorized to operate on the same channels or on channels with center frequencies offset by 12.5 kHz.

(d) Technical parameters governing the use of these channels are contained in Subpart S of Part 90 of this chapter.

(e) The Common Carrier Bureau coordinates the availability of channels in the 816-865 MHz frequency range with the Private Radio Bureau.

Subpart G - Air-ground Radiotelephone Service

§ 22.801 Scope.

The rules in this subpart govern the licensing and operation of public air-ground radiotelephone stations and systems. The licensing and operation of these stations and systems is also subject to rules elsewhere in this part that apply generally to the Public Mobile services. However, in case of conflict, the rules in this subpart govern.

§ 22.803 Procedure for mutually exclusive ground station applications.

Mutually exclusive applications for ground stations will be processed in accordance with the procedures set forth in § 22.509, except that, in the case of mutually exclusive applications filed on the same day, the Commission may seek to resolve the mutual exclusivity through a settlement conference pursuant to § 22.135 prior to conducting a random selection process.

GENERAL AVIATION AIR-GROUND STATIONS

§ 22.805 Channels for general aviation air-ground service.

The following channels are allocated for the provision of radiotelephone service to airborne mobile subscribers in general aviation (non-commercial) aircraft. These channels have a bandwidth of 20 kHz and are designated by their center frequencies in MegaHertz.

Signalling channel pair

ground	airborne mobile
454.675	459.675

Communication channel pairs

ground	airborne mobile	ground	airborne mobile
454.700	459.700	454.850	459.850
454.725	459.725	454.875	459.875
454.750	459.750	454.900	459.900
454.775	459.775	454.925	459.925
454.800	459.800	454.950	459.950
454.825	459.825	454.975	459.975

(a) Channel 454.675 MHz is assigned to each and every ground station, to be used only for automatically alerting airborne mobile stations of incoming calls.

(b) All airborne mobile channels are assigned for use by each and every airborne mobile station.

§ 22.809 Transmitting power limits.

The transmitting power of ground and airborne mobile transmitters operating on the channels listed in § 22.805 must not exceed the limits in this section.

(a) Ground station transmitters. The effective radiated power of ground stations must not exceed 100 Watts and must not be less than 50 Watts.

(b) Airborne mobile transmitters. The transmitter power output of airborne mobile transmitters must not exceed 25 Watts and must not be less than 4 Watts.

§ 22.811 Idle tone.

Whenever a ground station transmitter authorized to transmit on any of the communications channels listed in § 22.805 is available for service but is not providing service, a modulated signal must be continuously transmitted on the communication channel assigned to that transmitter. While this modulated signal is transmitted, the transmitter power must be between 10 and 20 dB lower than the normal transmitting power.

§ 22.813 Technical assignment criteria.

The rules in this section establish technical assignment criteria for the channels listed in § 22.805. These criteria are intended to provide substantial service volumes over areas that have significant local and regional general aviation activity, while maintaining the continuous nationwide in-route coverage of the original geographical layout.

(a) Distance separation for co-channel ground stations. The Commission may grant an application requesting assignment of a communication channel to a proposed ground transmitter only if the proposed antenna location is at least 800 kilometers (497 miles) from the antenna location of the nearest co-channel ground transmitter in the United States, its territories and possessions; and 1000 kilometers (621 miles) from the antenna location of the nearest co-channel ground transmitter in Canada.

(b) Dispersion. The Commission may grant an application requesting assignment of a communication channel to a proposed ground transmitter only if there are no more than five different communication channels already assigned to ground transmitters with antenna locations within a 320 kilometer (199 mile) radius of the proposed antenna location.

§ 22.815 Construction period for general aviation ground stations.

The construction period (see § 22.142) for general aviation ground stations is 12 months.

§ 22.817 Additional channel policies.

The rules in this section govern the processing of applications for authority to operate a ground station transmitter on any ground station communication channel listed in § 22.805 when the applicant has applied or been granted an authorization for other ground station communication channels in the same area. The general policy of the Commission is to assign one ground station communication channel in an area to a carrier per application cycle, up to a maximum of six ground station communication channels per area. That is, a carrier must apply for one ground station communication

channel, receive the authorization, construct the station, and notify the Commission of commencement of service before applying for an additional ground station communication channel in that area.

(a) Air-ground transmitters in same area. Any transmitter on any of the ground station channels listed in § 22.805 is considered to be in the same area as another transmitter on any ground station channel listed in § 22.805 if it is located less than 350 kilometers (217 miles) from that transmitter.

(b) Initial channel. The Commission will not assign more than one ground station communication channel for new ground stations. Ground stations are considered to be new if there are no authorized ground station transmitters on any channel listed in § 22.805 controlled by the applicant in the same area.

(c) Additional channel. Applications for ground transmitters to be located in the same area as an authorized ground station controlled by the applicant, but to operate on a different ground station communication channel, are considered as requesting an additional channel for the authorized station.

(d) Amendment of pending application. If the Commission receives and accepts for filing an application for a ground station transmitter to be located in the same area as a ground station transmitter proposed in a pending application previously filed by the applicant, but on a different ground station communication channel, the subsequent application is treated as a major amendment to change the technical proposal of the prior application. The filing date of any application so amended is the date the Commission received the subsequent application.

(e) Dismissal of premature applications for additional channel. If the Commission receives an application requesting an additional ground station communication channel for an authorized ground station prior to receiving notification that the station is providing service to the public on the authorized channel(s), the Commission may dismiss that application without prejudice.

(f) Dismissal of applications for seventh channel. If the Commission receives an application requesting an additional ground station communication channel for an authorized ground station which would, if granted, result in that station being assigned more than six ground station communication channels in the same area, the Commission may dismiss that application without prejudice.

§ 22.819 AGRAS compatibility requirement.

Except as provided in paragraph (a) of this section, stations transmitting on the channels listed in § 22.805 must operate in compliance with the technical and operational requirements contained in the document, "Technical Reference, Air-ground Radiotelephone Automated Service (AGRAS), System Operation and Equipment Characteristics", dated April 12, 1985.

(a) Until January 1, 1994, stations may continue to operate in compliance with the previous standard adopted in Docket 16073.

(b) Copies of the document referenced in this section may be obtained from the Commission's copying contractor.

§ 22.821 Authorization for airborne mobile stations.

An authorization separate from any ground station authorization is required for each airborne mobile station that operates on the channels listed in § 22.805. The operator of the airborne mobile station must apply for the authorization (FCC Form 409). The application must contain an affirmative representation that the applicant has made definite arrangements with a wireline common carrier for service and billing.

COMMERCIAL AVIATION AIR-GROUND SYSTEMS

§ 22.857 Channel plan for commercial aviation air-ground systems.

The 849-851 and 894-896 MHz frequency ranges are allocated for block assignment to nationwide air-ground systems providing radiotelephone service to passengers aboard commercial aircraft. Ground stations transmit on channels in the 849-851 MHz range. Airborne mobile stations transmit on channels in the 894-896 MHz range. Systems using these channels must conform to the channel plan described in this section.

(a) Channel blocks. The spectrum allocated for commercial aviation air-ground systems is divided into ten channel blocks, numbered 1 through 10. All ground stations in each geographical area must use the same channel block for communication with airborne mobile stations in flight, in accordance with § 22.859.

(1) Each channel block is subdivided into 6 control channels labeled P-1 through P-6, and 29 communications channels labeled C-1 through C-29.

(2) The authorized channel bandwidths are as follows:

(i) Each control channel has a bandwidth of 3.2 kHz.

(ii) Each communications channel has a bandwidth of 6 kHz.

(b) The center frequencies (in MegaHertz) of the communications and control channels are listed in Tables G-1 and G-2.

§ 22.859 Geographical channel block layout.

Except as provided in paragraphs (a) and (b) of this section, ground station locations must be within 1.6 kilometers (one mile) of the locations listed in this paragraph. The channel block allotted for each location must be used to provide service to airborne mobile stations in flight and may be used to provide service to airborne mobile stations on ground.

Location	N. Latitude	W. Longitude	Channel Block
ALASKA			
Anchorage	61°11'06"	149°54'42"	8
Cordova	60°33'00"	145°43'00"	5
Ketchikan	55°21'20"	131°42'33"	5
Juneau	58°21'18"	134°34'30"	4
Sitka	57°03'30"	135°22'01"	7
Yakutat	59°30'30"	142°30'00"	8
ALABAMA			
Birmingham	33°23'24"	86°39'59"	2
ARIZONA			
Phoenix	33°35'39"	112°05'12"	4
Winslow	35°01'17"	110°43'02"	6

ARKANSAS			
Pine Bluff	34°10'56"	91°56'18"	8
CALIFORNIA			
Blythe	33°36'39"	114°42'24"	10
Eureka	40°42'59"	124°12'09"	8
Los Angeles	33°56'45"	118°23'03"	4
Oakland	37°51'12"	122°12'30"	1
San Francisco	37°41'15"	122°26'01"	6
Visalia	36°19'36"	119°23'22"	7
COLORADO			
Colorado Springs	38°44'39"	104°51'46"	8
Denver	39°46'45"	104°50'49"	1
Hayden	40°29'04"	107°13'08"	6
FLORIDA			
Miami	25°48'27"	80°16'30"	4
Orlando	28°26'53"	81°22'00"	2
Tallahassee	30°24'02"	84°21'18"	7
GEORGIA			
Atlanta	33°39'05"	84°25'54"	8
St. Simons Island	31°09'22"	81°23'14"	6
HAWAII			
Mauna Kapu	21°24'24"	158°06'02"	5
IDAHO			
Blackfoot	43°11'34"	112°20'57"	8
Caldwell	43°38'45"	116°38'44"	10
ILLINOIS			
Chicago	41°46'49"	87°45'20"	3
Kewanee	41°12'05"	89°57'33"	5
Schiller Park	41°57'18"	87°52'57"	2
INDIANA			
Fort Wayne	40°59'16"	85°11'31"	7
IOWA			
Des Moines	41°31'58"	93°38'54"	1
KANSAS			
Garden City	37°59'35"	100°54'04"	3
Wichita	37°37'24"	97°27'15"	7
KENTUCKY			
Fairdale	38°04'48"	85°47'33"	6
LOUISIANA			
Kenner	30°00'44"	90°13'30"	3
Shreveport	32°27'09"	93°49'38"	5
MASSACHUSETTS			
Boston	42°23'15"	71°01'03"	7
MICHIGAN			
Bellville	42°12'17"	83°29'09"	8
Flint	42°58'21"	83°44'22"	9
Sault Saint Marie	46°28'45"	84°21'31"	6
MINNESOTA			
Bloomington	44°51'30"	93°13'19"	9
MISSISSIPPI			
Meridian	32°19'10"	88°41'33"	9
MISSOURI			
Kansas City	39°18'37"	94°41'07"	6
St. Louis	38°42'45"	90°19'19"	4
Springfield	37°14'28"	93°22'54"	9
MONTANA			
Lewistown	47°02'56"	109°27'27"	5
Miles City	46°25'30"	105°52'30"	8
Missoula	47°01'05"	114°00'41"	3
NEBRASKA			
Grand Island	40°58'00"	98°19'11"	2
Ogallala	41°07'11"	101°45'37"	4
NEVADA			
Las Vegas	36°05'35"	115°10'25"	1
Reno	39°35'13"	119°55'52"	3
Tonopah	38°04'21"	117°13'15"	9
Winnemucca	41°00'39"	117°45'58"	4
NEW MEXICO			
Alamogordo	32°54'46"	105°56'41"	8
Albuquerque	35°03'05"	106°37'13"	10
Aztec	36°48'42"	107°53'48"	9
Clayton	36°27'29"	103°11'16"	5
NEW JERSEY			
Woodbury	39°50'01"	75°09'21"	3
NEW YORK			
E. Elmhurst	40°46'21"	73°52'42"	1
Schuyler	43°09'09"	75°07'50"	2
Staten Island	40°36'05"	74°06'35"	9
NORTH CAROLINA			
Greensboro	36°05'54"	79°56'42"	9
Wilmington	34°16'10"	77°54'24"	7
NORTH DAKOTA			
Dickinson	46°51'05"	102°47'35"	7
OHIO			
Pataskala	40°04'38"	82°41'57"	1
OKLAHOMA			
Warner	35°29'31"	95°18'25"	4
Woodward	36°24'42"	99°28'50"	9
OREGON			
Albany	44°38'24"	123°03'36"	5
Klamath Falls	42°06'30"	121°38'00"	2
Pendleton	45°35'45"	118°31'02"	7
PENNSYLVANIA			
Coraopolis	40°30'33"	80°13'27"	4
New Cumberland	40°11'30"	76°52'02"	8
SOUTH CAROLINA			
Charleston	32°54'10"	80°01'20"	4